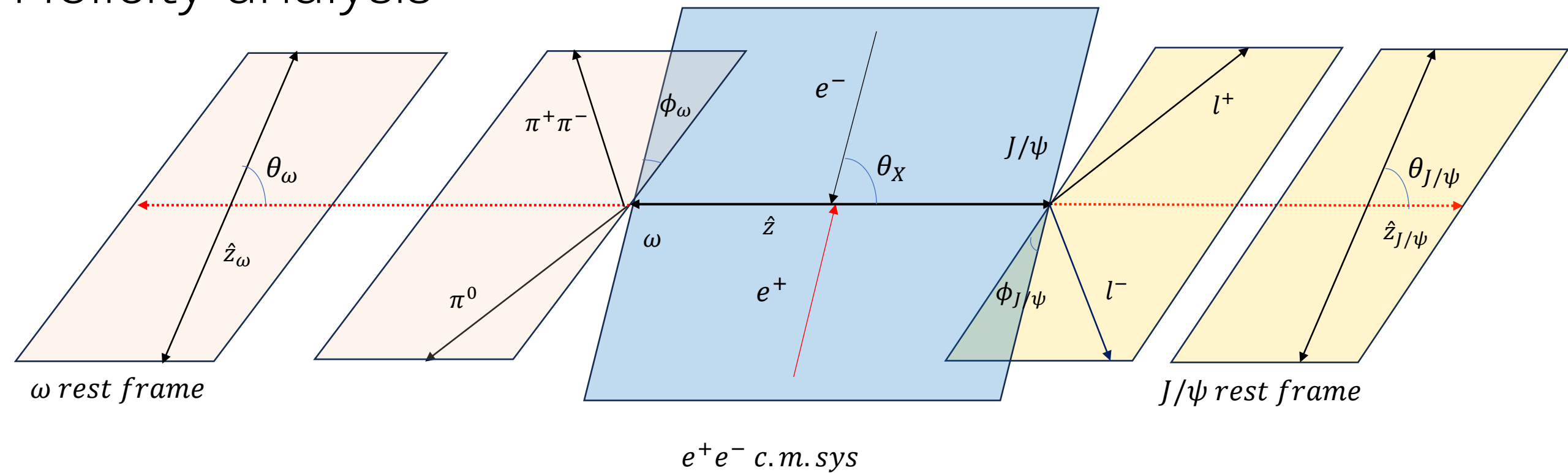


# Group meeting

2026/01/16

# Helicity analysis



$\theta_X$ :  $e^+e^-$  质心系下  $J/\psi$  与  $z$  轴的极角。  
 $\phi_{J/\psi}(\phi_\omega)$ :  $J/\psi(\omega)$  产生平面与衰变平面的夹角。  
 $\theta_{J/\psi}$ :  $J/\psi$  质心系下  $l$  与  $z$  轴的极角。  
 $\theta_\omega$ :  $\omega$  质心系下衰变平面的法向量与  $z$  轴的夹角。

0<sup>+</sup>假设下角分布:

## 归一化条件

$$3 H_1^2 + 2 H_2^2$$

|余弦

| 余弦

| 余弦

|余弦

| 余弦

| 余弦

| 正弦

| 余弦

| 正弦

| 正弦

$2^+(0)$ 下角分布:

(★并行积分★)

并行映射

| 积分

| 积分

| 积分

| 积分

| 积分

| 积分

| 积分

| 积分

(\*最终积分\*)

[illegible]

| 系数

| 系数

| 系数

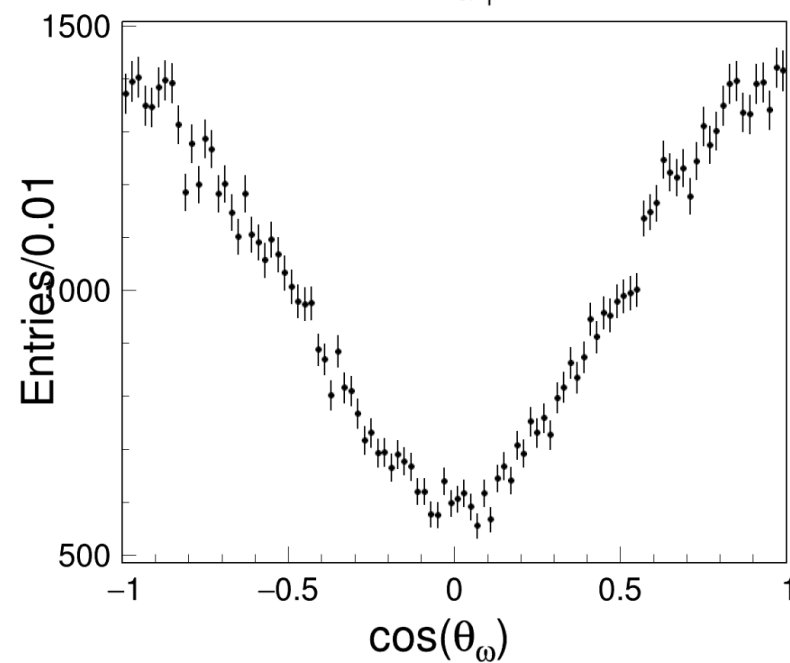
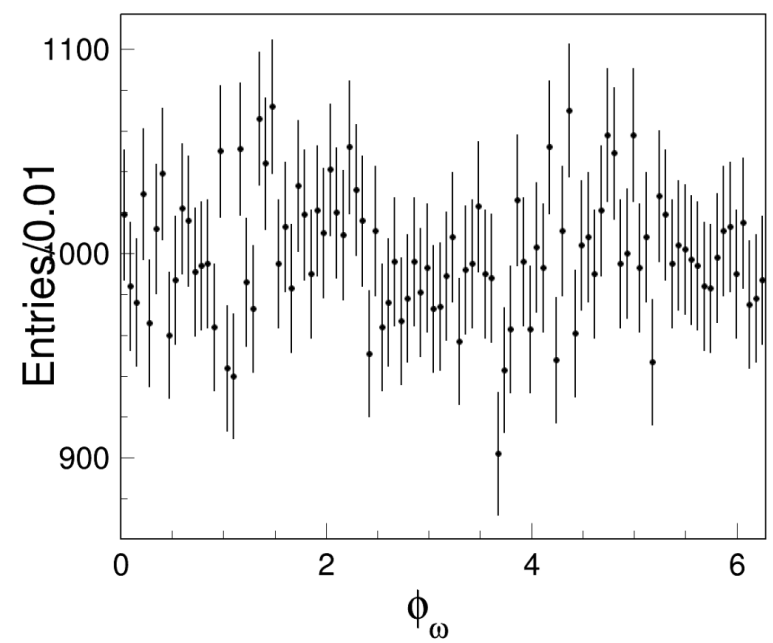
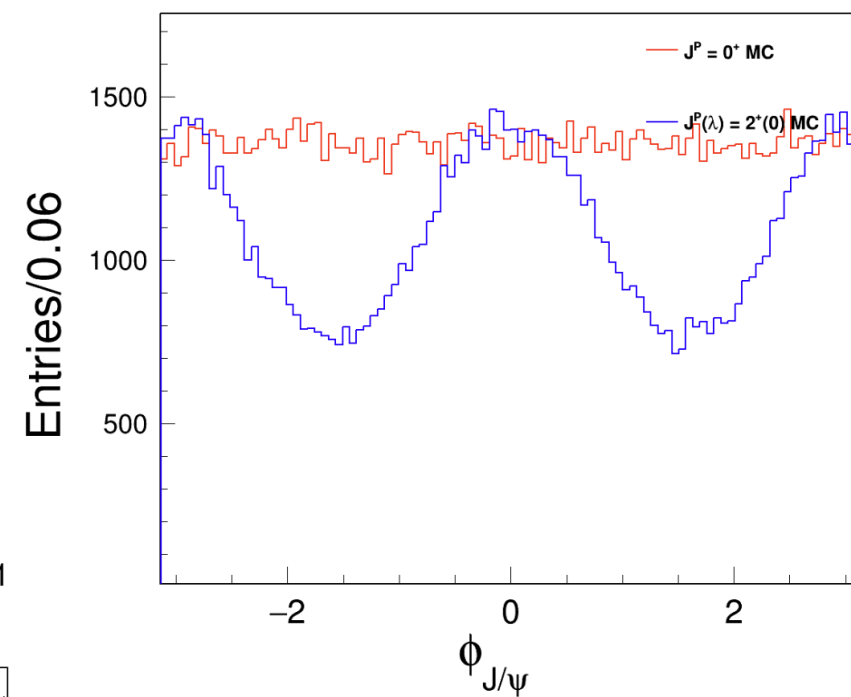
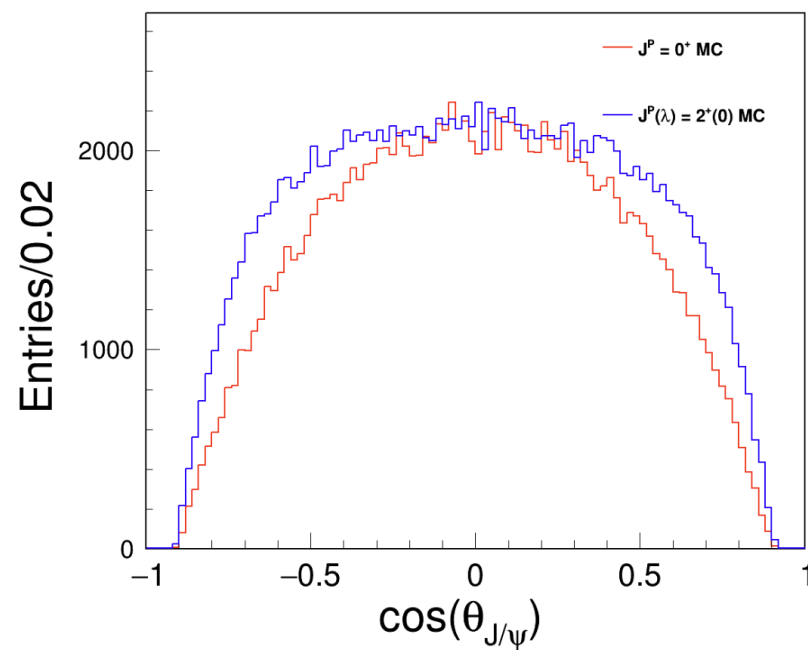
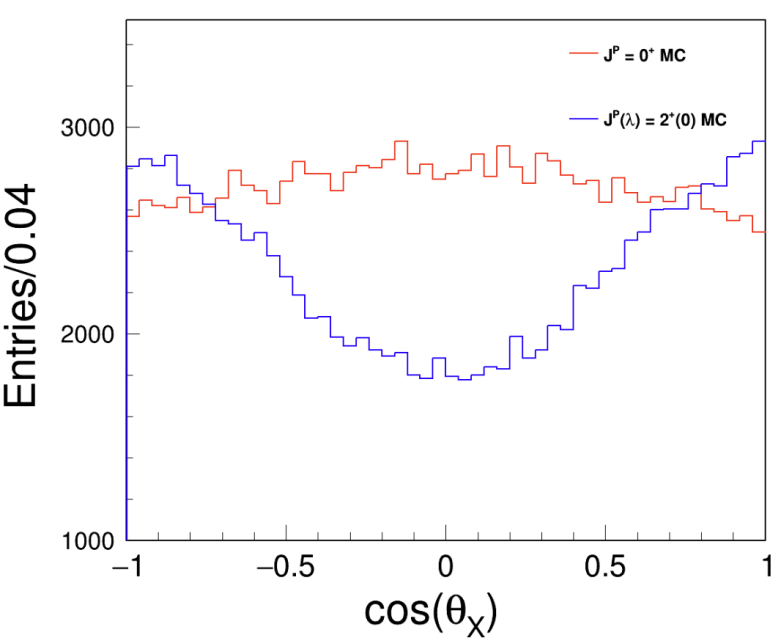
= Coef

= Coef

(★构建归一化条件★)

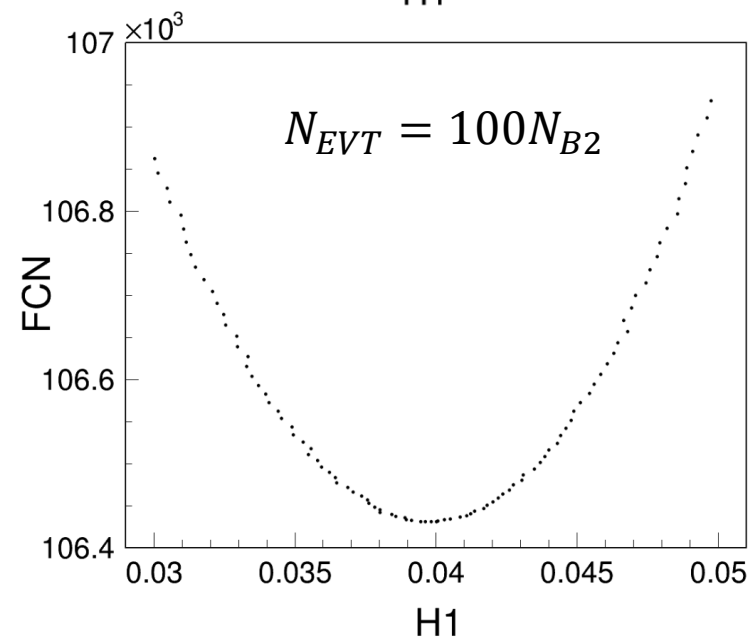
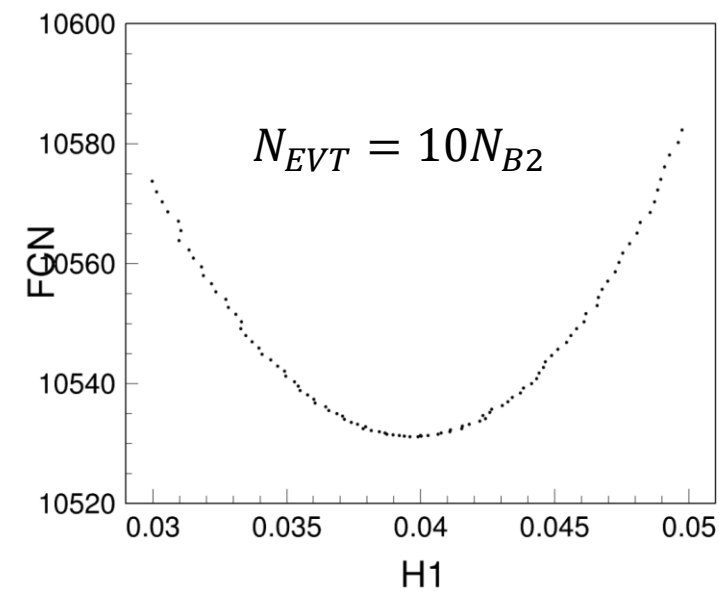
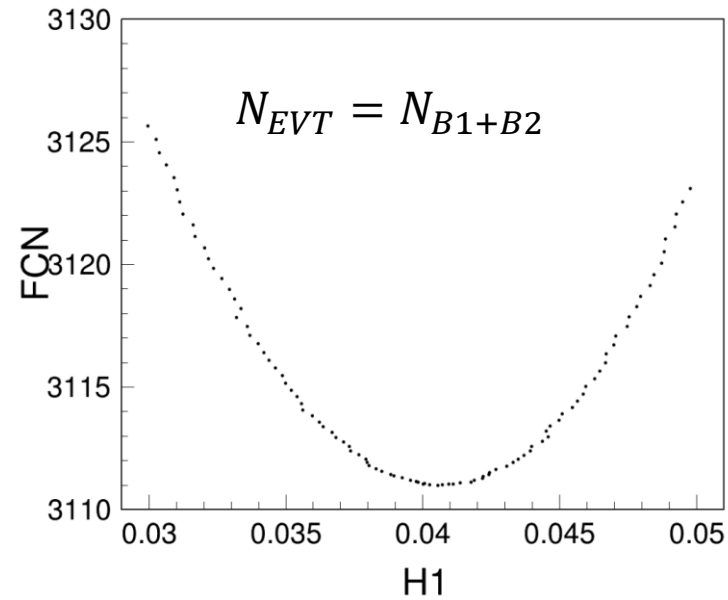
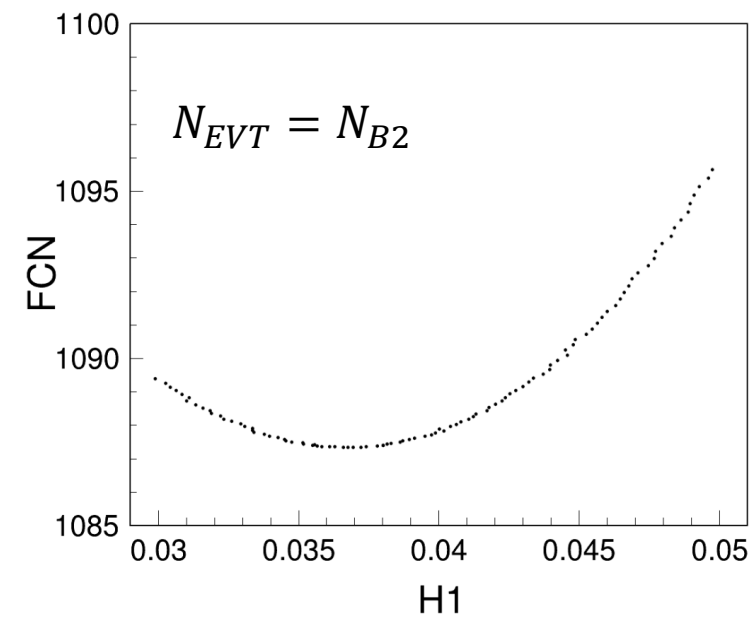
$$\frac{33 \text{ H}1^2 \pi^5}{64} + \frac{3 \text{ H}2^2 \pi^5}{32} + \frac{27 \text{ H}3^2 \pi^5}{128} + \frac{9 \text{ H}4^2 \pi^5}{32} + \frac{11 \text{ H}5^2 \pi^5}{128}$$

# Distribution check:



# FCN value Check:

$H1_{true} = 0.04$ , 取不同EVT数, 检查对应FCN

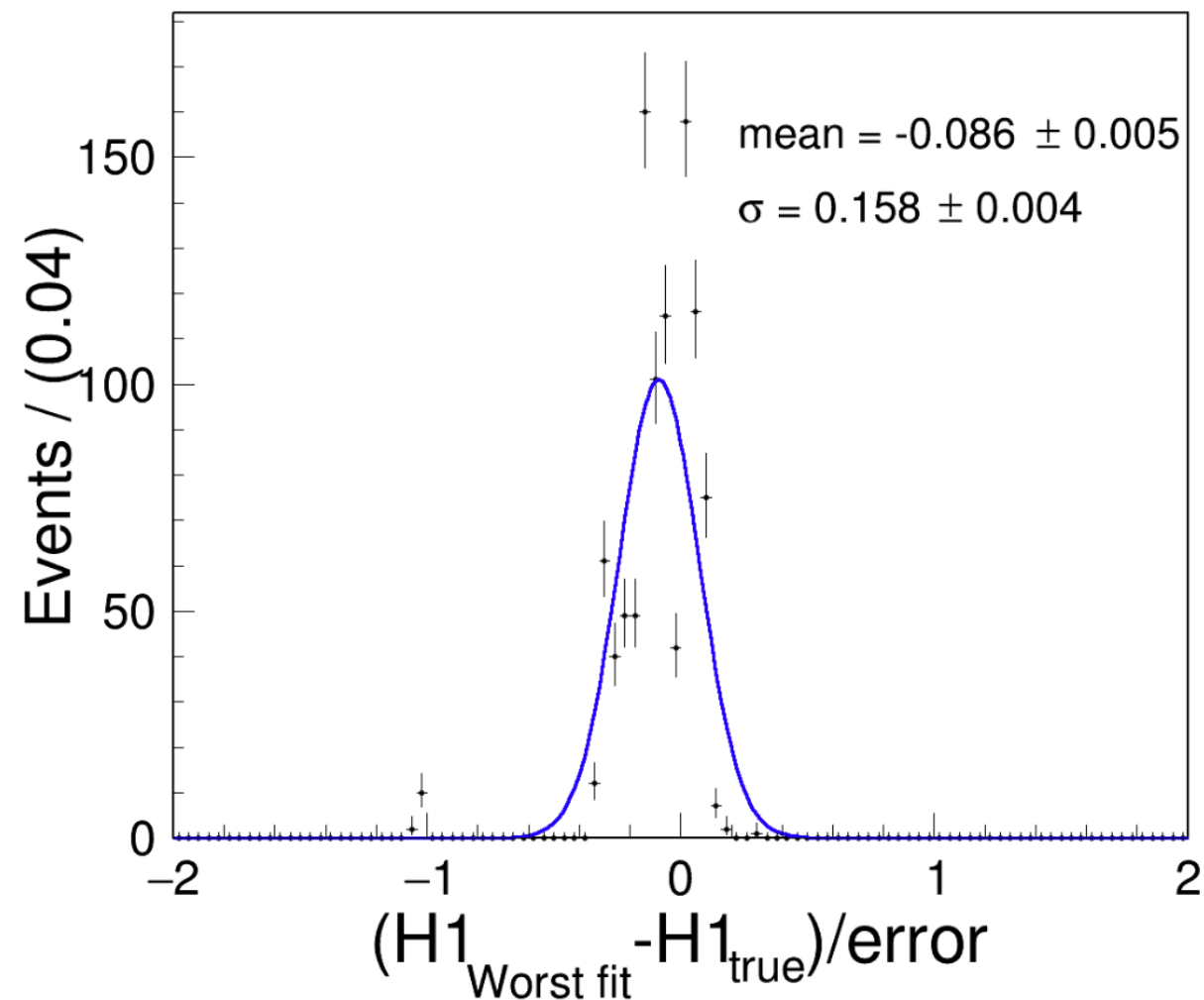
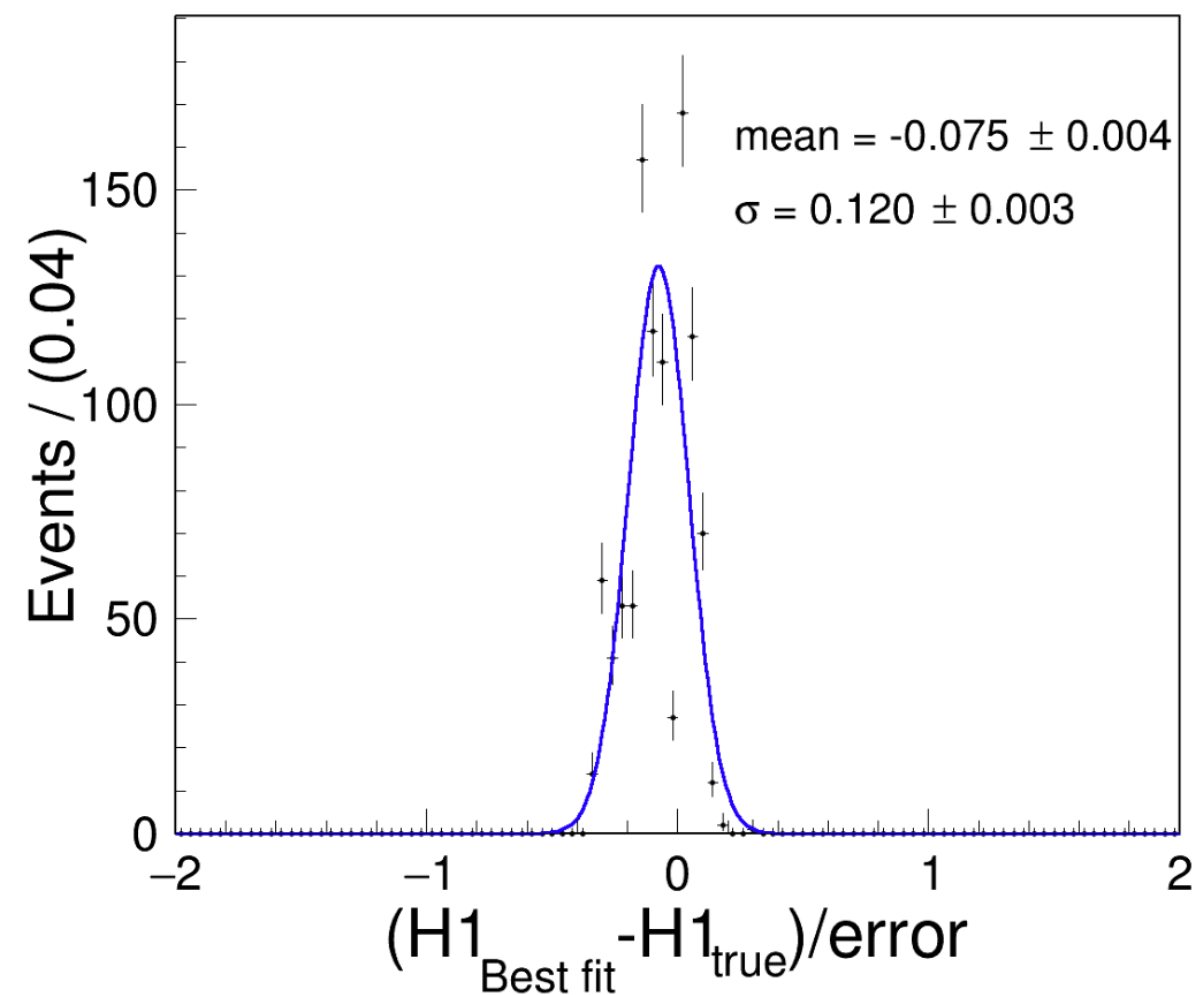


# Pull Check (systematic uncertainty) :

Generate 1000 toy MC from root

$$H1_{true} = 0.04, N_{EVT} = B1 + B2$$

对每一个蒙卡，在H1的物理允许范围内取随机拟合初值做100次拟合，取FCN最大和最小为Worst与Best。



# Hypothesis Test:

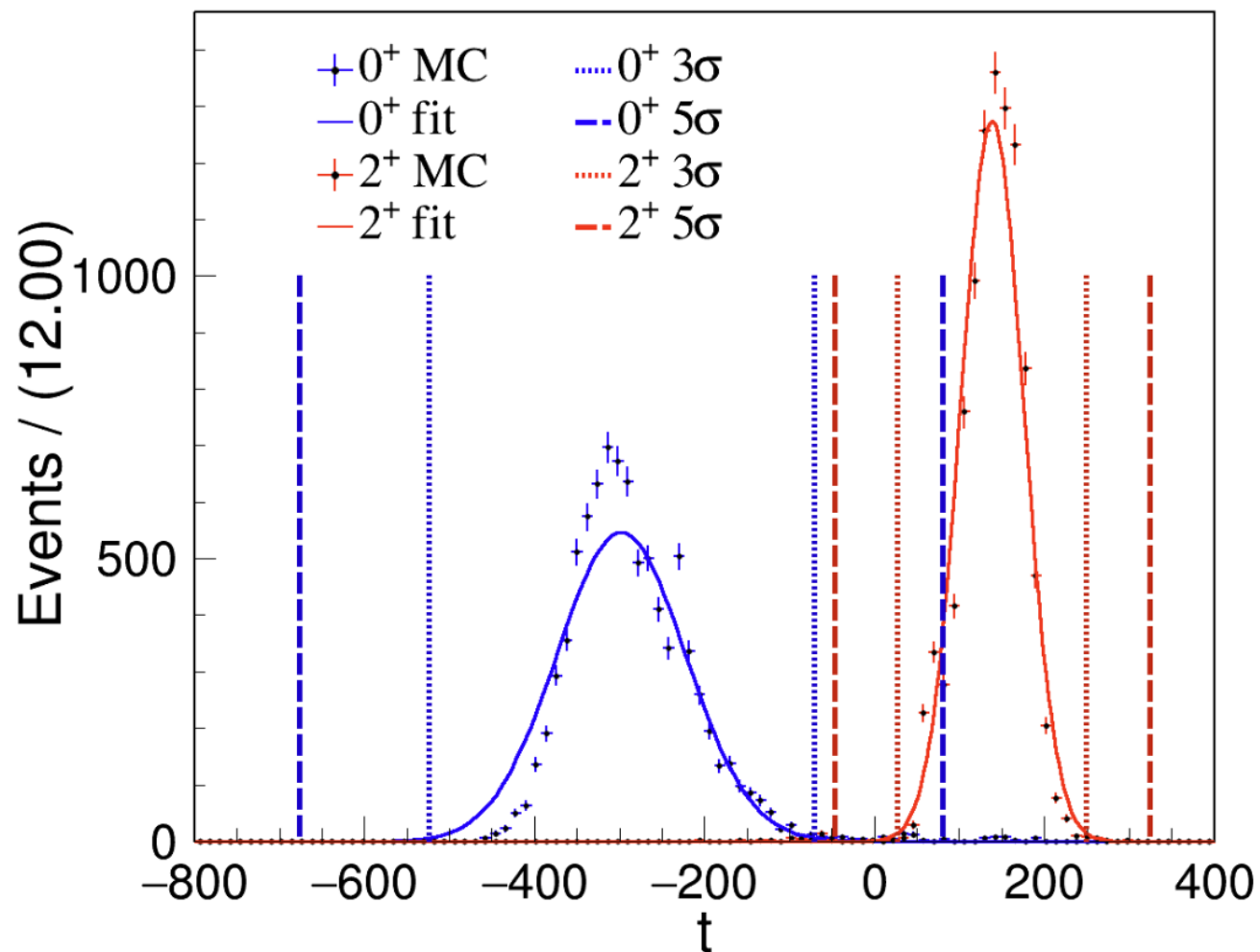
Generate 1000 toy MC from root

$$N_{EVT} = N_{B2}$$

$$H1_{B2} = 0.02$$

```
"H1_twoplus", sqrt(1.0 / pow(M_PI, 5) * 32. / 33. / 5.),  
"H2_twoplus", sqrt(1.0 / pow(M_PI, 5) * 16. / 3. / 5.),  
"H3_twoplus", sqrt(1.0 / pow(M_PI, 5) * 64. / 27. / 5.),  
"H4_twoplus", sqrt(1.0 / pow(M_PI, 5) * 16. / 9. / 5.),  
"H5_twoplus", sqrt(1.0 / pow(M_PI, 5) * 64. / 11. / 5.),
```

$$t = -2\ln[\mathcal{L}^{J=0^+} / \mathcal{L}^{J=2^+}]$$



Next to do:  
Check the pull  
Update note  
Add the detector effect